

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 February 2004 (19.02.2004)

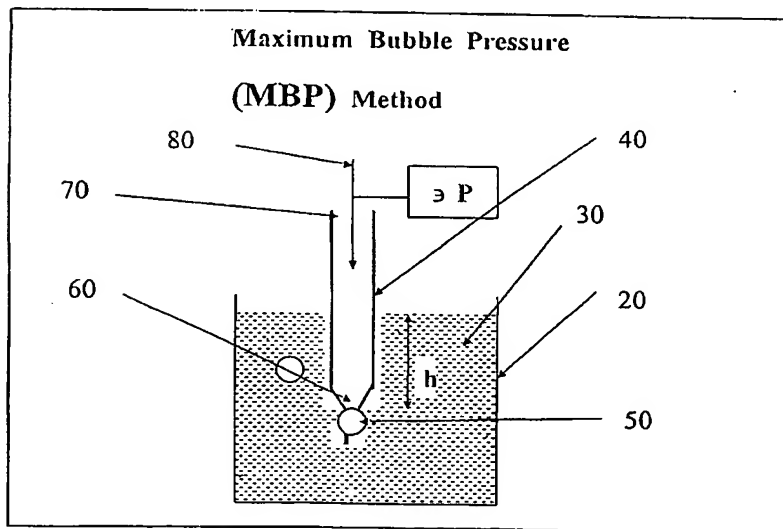
PCT

(10) International Publication Number
WO 2004/015379 A3

- (51) International Patent Classification⁷: G01N 33/32 (71) Applicants and
(72) Inventors: SPRYCHA, Ryszard [US/US]; 2 Hillside
(21) International Application Number: PCT/US2003/025137 Terrace, Wallington, NJ 07057 (US). SMITH, Doreen, E.
[US/US]; 121 Chestnut Street, Belleville, NJ 07109 (US).
BIRO, David [US/US]; 42 Cayuga Avenue, Rochaway,
(22) International Filing Date: 8 August 2003 (08.08.2003) NJ 07866 (US). PARRIS, Juanita [US/US]; 23 Stemler
Drive, Cliftwood, NJ 07221 (US). LAKSIN, Mikhail
[US/US]; 2278 Redwood Road, Scotch Plains, NJ 07072
(25) Filing Language: English (US). PACE, Gregory [US/US]; 50 Lincoln Avenue,
Wood Ridge, NJ 07075 (US).
(26) Publication Language: English (74) Agent: PERSLEY, Sidney; 222 Bridge Plaza South, Fort
Lee, NJ 07024 (US).
(30) Priority Data: 60/401,957 8 August 2002 (08.08.2002) US (81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
(71) Applicant (*for all designated States except US*): SUN
CHEMICAL CORPORATION [US/US]; 322 Bridge
Plaza South, Fort Lee, NJ 07024 (US).
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR QUANTATIVELY MEASURING LIQUID FILM DRYING RATES ON SUBSTRATES



(57) Abstract: An apparatus and method for measuring the drying rate of a liquid or liquid film in air or other gaseous media by either: a) measuring changes in the print density of the liquid; b) measuring changes in the dynamic surface tension of the liquid; c) measuring the differential pressure between an inert gas required to displace a sample of the liquid drawn into a capillary tube from a reservoir of the liquid and the pressure required for a bubble of the gas to form in the reservoir; and d) measuring the electrical conductance or resistance of the liquid.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
24 June 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/25137

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01N33/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G01N B41F B41J C09D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 140 902 A (SCHNEIDER GEORG) 25 August 1992 (1992-08-25) column 3, line 22 - line 57; figures	1-11
Y	US 3 881 349 A (STONE JOSEPH J) 6 May 1975 (1975-05-06) claim 1; figures	1-11
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

27 January 2004

Date of mailing of the international search report

16.04.04

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Wilhelm, J

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/25137

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CARREIRA LEONARD ET AL: "Correlation between drying time and ink jet print quality parameters" PROCEEDINGS OF THE 1995 IS&T'S 11TH INTERNATIONAL CONGRESS ON ADVANCES IN NON-IMPACT PRINTING TECHNOLOGIES;HILTON HEAD, SC, USA OCT 29-NOV 3 1995, 1995, pages 334-337, XP008026853 Proc IS T Int Congress Adv Non Impact Printing Technol;Proceedings of the IS&T's International Congress on Avances in Non-Impact Printing Technologies 1995 Soc Imaging Sci Technol, Springfield, VA, USA page 335, right-hand column, line 9 - line 31; figure 2	1-11
A	----- SARADA T: "INK JET PRINTING ON PLAIN PAPER" 1984 INTERNATIONAL PRINTING & GRAPHIC ARTS/TESTING CONFERENCE, PROCEEDINGS OF THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY.;NIAGARA FALLS, NY, USA, 1984, pages 57-62, XP008026852 1984 TAPPI Press, Atlanta, GA, USA page 59, right-hand column, line 15 - line 19; figure 4	1-11
A	----- ASTM Standard D1640-95 (April 1995) paragraphs [6.1.] - [7.9.] -----	1-11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/25137

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Densitometric determination of drying rate

2. claims: 12-15

Viscometric determination of drying rate

3. claims: 16-37

Conductometric determination of drying rate

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/25137

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5140902	A	25-08-1992	DE 4021183 A1	16-01-1992
			AT 127587 T	15-09-1995
			DE 9011283 U1	25-10-1990
			DE 59106406 D1	12-10-1995
			EP 0464617 A1	08-01-1992
			JP 2066364 C	24-06-1996
			JP 4232748 A	21-08-1992
			JP 7100373 B	01-11-1995
			SU 1813052 A3	30-04-1993

US 3881349	A	06-05-1975	NONE	
